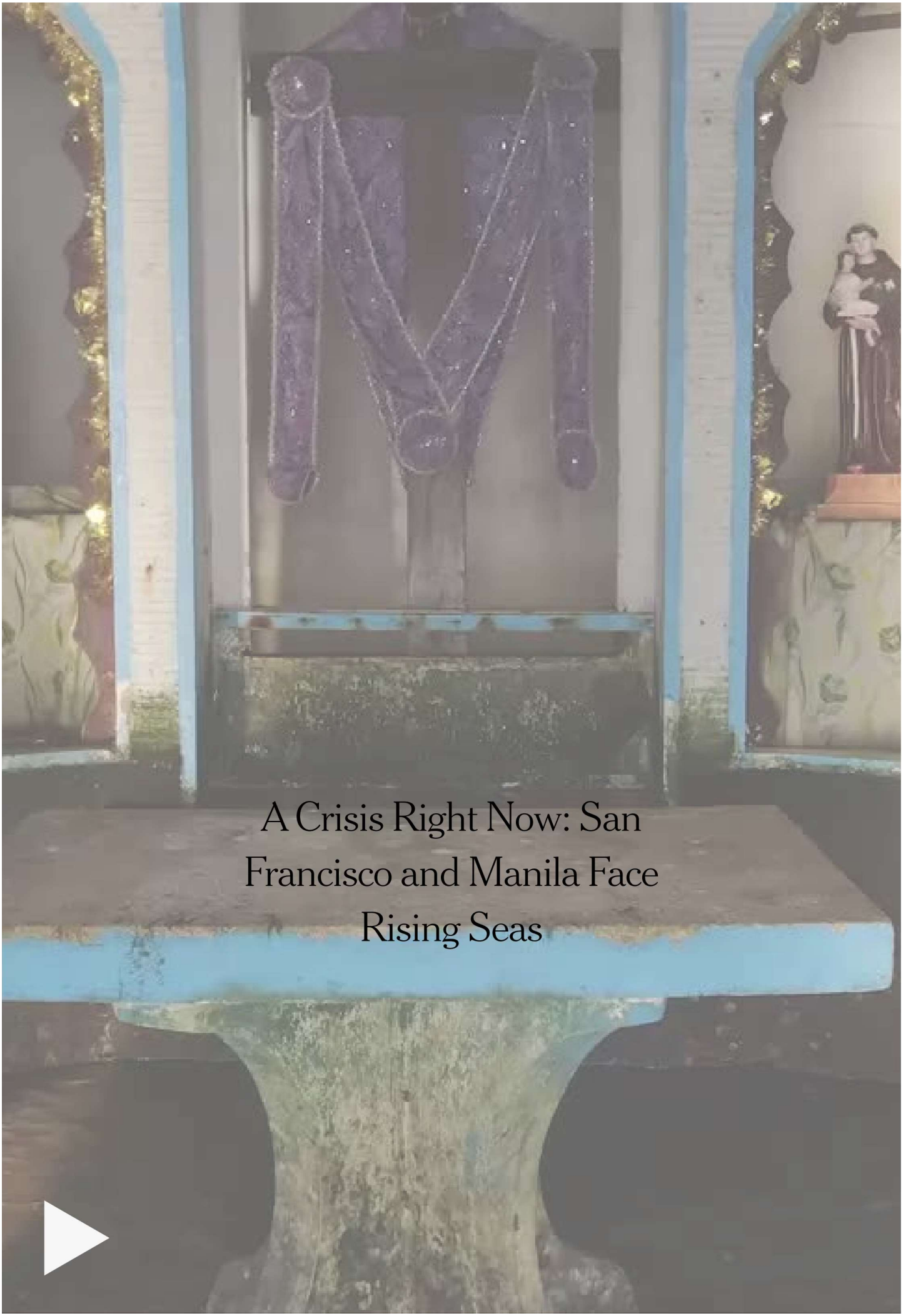

A Crisis Right Now: San Francisco and Manila Face Rising Seas

Pariahan, north of Metropolitan Manila.

Somini Sengupta, The New York Times global climate reporter, and Chang W. Lee, a photographer for The Times, traveled to the Philippines and California to see how rising sea levels are affecting two big metropolitan areas.

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What do you do when the sea comes for your home, your school, your church?

You could try to hold back the water. Or you could raise your house. Or you could just leave.

An estimated 600 million people live directly on the world's coastlines, among the most hazardous places to be in the era of climate change. According to scientific projections, the oceans stand to rise by one to four feet by the end of the century, with projections of more ferocious storms and higher tides that could upend the lives of entire communities.

Many people face the risks right now. Two sprawling metropolitan areas offer a glimpse of the future. One rich, one poor, they sit on opposite sides of the Pacific Ocean: the San Francisco Bay Area (population 7 million) and metropolitan Manila (almost 14 million).

Their history, their wealth, and the political and personal choices they make today will shape how they fare as the water inevitably comes to their doorsteps.

In both places, it turns out, how you face the rising sea depends mostly on the accident of your birth: Whether you were born rich or poor, in a wealthy country or a struggling one, whether you have insurance or not, whether your property is worth millions or is little more than a tin roof.

And, in both places, climate change has magnified years of short-sighted decisions. Manila allowed groundwater to be pumped out so fast that the land sagged and turned into a bowl just as the sea was rising. The Bay Area allowed people to build right at the water's edge, putting homes, highways, even airports at risk of catastrophic flooding.

But people tend to hold on, often ingeniously, as the water rises around them. In some cases that's because their properties are worth a lot, for now, at least, or because they have so little that they have nowhere else to go.

Now, Manila and the Bay Area face tough choices. They could adapt to the rising tide, which could mean moving people out of harm's way. Or, they could try to force the water to adapt to their needs by raising their defenses. For leaders, politically tough decisions lie ahead. What do they save on the water's edge, what do they forsake and how do they reimagine their coastal cities in an age of climate disruptions?

The Bay Area and Metropolitan Manila are both big and growing, with a lot of people and things to protect on the coast. How they deal with their circumstances today may offer lessons, for better or worse, for coastal cities elsewhere.

"Are we going to decide by not deciding, and wait for the water to reach our doorsteps?" asked Aaron Peskin, a member of the San Francisco board of supervisors.

"The biggest challenge is getting society to understand it, grapple with it, address it, plan for it, discuss the trade-offs."

Metropolitan Manila
Rising water, sinking city

Desiree Alay-ay is in the thick of trade-offs.

Ms. Alay-ay, 30, grew up in a low-lying, flood-prone neighborhood on the northern fringe of Manila. It is not what she wants for her newborn baby. She wants to move, and take her parents with her.

Climate change has exacerbated a longtime problem in Manila. Because of a proliferation of fish ponds and the rapid extraction of groundwater, the ground has been subsiding. As a result, since the early 1990s, sea levels have risen much faster than the global average.

Desiree Alay-ay at home in the Malabon area of Manila.

Storms repeatedly sweep away spindly-legged bamboo and tin houses on the water. People flee for a while, only to come back because they have nowhere better to go. In low-lying neighborhoods, like Ms. Alay-ay's, roads have been raised multiple times. Pariahan, a village just north of the city line, is now permanently underwater.

"Climate change doesn't create its own impacts. It magnifies wrong policies," said Renato Redentor Constantino, executive director of the Manila-based Institute for Climate and Sustainable Cities. "This is the case with sea level rise. A large part of Metropolitan Manila is facing more water-related impacts because of decades of myopic, cross-eyed land use planning."

More than 30 years ago, before Ms. Alay-ay was born, her parents, migrants from the countryside, built a small house in Malabon, the only neighborhood they could afford in Manila.

The water pooled up in the streets every rainy season. When they were kids, Desiree and her brother sneaked out and swam in the streets sometimes. Leaky sewers meant human waste sometimes floated by, which they referred to as "bazookas." Only tricycle cabs could ply through floods; when the water rose, her parents took her to school in a rented boat.

Roads have been raised several times in low-lying areas like Malabon.

The city fought back by raising the road. So, Desiree's parents raised their house to stay above the road. They poured cement and sand on the floor, four times in 30 years, as though adding layers to a wedding cake.

Everyone lived like this. One neighbor raised the floor so high that the original kitchen sink is now ankle-high. Another abandoned the house altogether; its roof is barely above street level now, and water hyacinths have taken over the rooms.

Ms. Alay-ay is trying to move her family out of Malabon. “I want my baby to have a good future,” she said.

Ms. Alay-ay’s neighbor, Rorencia Trupa, 92, and family members.

A bamboo extension built onto a flooded home in Pariahan, just outside Metro Manila.

Anna Lampitoc and her children. They were moved to public housing after a typhoon destroyed their home outside a sea wall.

A home in Pariahan. Its original concrete foundation is now underwater.

It was only after Ms. Alay-ay had a baby that she set her mind to getting out of Malabon.

“I want my baby to have a good future,” Ms. Alay-ay said. “I don’t want him to experience what I’ve experienced.”

She wanted her parents to come, too, so they could watch the baby while she and her husband went to work. But they had other plans. Leave the baby with us, her mother, Zucema Rebaldo, offered. But we’re not moving. This is our home.

“This was a happy place for us,” Mrs. Rebaldo said on a Sunday afternoon when I went to visit. “Even if people say one day it will be wiped out from the map. No question, I am staying.”

A home on stilts in Pariahan that’s been raised three times. “You need some sort of rational, organized retreat from the coast,” one policy analyst said.

Images of Christ looked down from the walls. Roosters crowed. Everyone knows her here, she said. They call her Lola Cema — Lola means grandmother, Cema is short for Zucema. They help one another out.

“I will die in this place,” she said.

Her daughter listened quietly. She had heard this before, and, this afternoon, her face washed over with pain.

“It’s hard,” she said. “As their child I want them to move out of here to a place that’s not flooded.” Months of negotiations had ended in a deadlock.

Ms. Alay-ay's dilemma is magnified manyfold in a megacity like Manila.

Millions of the city's poorest live in hazardous, low-lying areas that are already lashed by tropical storms. Climate change is projected to make those storms even more intense and more frequent.

But, leaving those areas can mean being even farther from where you make a living. Or losing the neighborhood health clinic you've been going to for years. Or being marooned in a neighborhood where there are no tricycle cabs, let alone public transportation.

Forcing people to move away from the coast is not enough, said Antonia Yulo-Loyzaga, a member of the board of directors of the Manila Observatory, a research organization. They need to be able to find work nearby, or an efficient public transportation system to get there. That doesn't exist now; average commutes are two hours or more each way.

"You need some sort of rational, organized retreat from the coast," she said. "There's no option unless you want people to live in constant fear."

San Francisco Bay Area

A political lightning rod

A rising sea underscores the missteps of the past in the Bay Area, too.

The Pacific has risen 4 to 8 inches along the Northern California shore over the last century — and so, too, the San Francisco Bay, the ocean's largest estuary in the Americas. Depending on the growth of greenhouse gas emissions, the Pacific could rise 2.4 to 3.4 feet by 2100, which is why the California Coastal Commission has encouraged city governments to start planning for the future, either by fortifying their flood defenses, restoring wetlands, or, in some instances, making people move.

That is as difficult in the Bay Area as it is in Manila. "People's properties and investments are at risk," Jack Ainsworth, head of the commission, said in an interview. "It becomes very political and very emotional."

Unlike Manila, Bay Area municipalities are wealthy. And many of them are already paying handsomely to fortify high-value coastal infrastructure at risk.

Voters in San Francisco have approved a $425 million bond measure to start fortifying a sea wall along the bayfront road, the Embarcadero. Along the road sits some of the city's most expensive real estate; below it sits a subway line, a light rail tunnel, and part of the city's sewage infrastructure.

Meanwhile, the builders of a new real estate development in a former industrial area called Mission Creek are raising the old roads and warehouses by as much as 10 feet. And the San Francisco airport, which sits on tidal marshlands, is getting a $587 million makeover to raise its sea wall.

John Raymond at home in Pacifica, Calif.

Farther south, a suburban community called Foster City, built on steadily subsiding landfill, has raised property taxes to increase the height of a levee that protects the area from storm surges. Nearby, county officials have rebuilt another levee to protect a golf course, along with a low-income community called East Palo Alto.

And on San Francisco's rugged Pacific shore, on Ocean Beach, a caravan of dump trucks is shifting sand to control erosion, while a portion of the adjacent coastal road known as the Great Highway is being moved inland.

"We basically built everything just about at the high tide line," said Laura Tam, a policy director at SPUR, a Bay Area urban planning and research group. "Nothing was built thinking of future changes in tides. We didn't

think about sea level rise."

The Embarcadero in San Francisco. Voters have approved a $425 million bond measure to fund a sea wall.

Water pumps at the San Francisco airport. The site is getting a $587 million makeover to raise its sea wall.

Construction vehicles shifted sand in an effort to fight erosion at Ocean Beach in San Francisco.

Alan Grinberg pays for a wall of intricately layered boulders to slow the erosion of the bluff below his home in Pacifica.

The OceanAire apartment complex in Pacifica. Built in the 1970s, it initially had a wide, grassy lawn facing the ocean.

Nowhere is the danger more starkly on display as it is in Pacifica, a suburb south of the city, where coastal bluffs are so swiftly eroding that city officials have already demolished some properties before they could fall into the water.

And this is where John Raymond's dilemma is like a mirror image of what Desiree Alay-ay faces across the ocean. Around the time her parents built their house in Malabon, Mr. Raymond, a bankruptcy lawyer, bought his house on a bluff on the edge of the sea. The sound of the waves is a daily soundtrack.

One look from his window, and he can tell if it's a good day to surf. He loves it here. He wants to stay for as long as possible. But Mr. Raymond, 60, is also keenly aware of the risks.

The force of the waves has broken his garage doors a few times. His neighbor's windows have been broken by the pebbles tossed up by the beach. The only thing that protects his property from a rising sea, he knows, is a publicly funded sea wall right out front, erected to safeguard a sewer line and a coastal road. In a bad storm, when the waves pound that wall, his house shakes. His fear is that one day, the wall collapses — and his house gets red-tagged for demolition.

"If my house gets condemned because the sea wall fails and the ocean comes to the front door, I have to leave, and that's that," he said. "I'm taking the risk my house goes to zero."

The soft, sandy bluffs have been eroding for thousands of years. Climate change is accelerating that process, though, said Charles Lester, a former Coastal Commission official who now directs the Ocean and Coastal Policy

Center at the University of California, Santa Barbara. The tides are higher and the waves are more frequently coming up to the foot of the bluffs.

On a gray Monday morning, Mr. Lester stood at the edge of the bluff on the north end of town, on a walking path that ribbons around an apartment complex called OceanAire. He pulled up on his phone a picture taken in the 1970s, when the complex was built: A wide grassy lawn lay in front. That's gone. Even when he first came here 10 years ago, the bluff was 90 feet wider. The bluff has stepped back since then. Today, at its narrowest point, a few steps separate an apartment balcony from the cliff's edge.

A sea wall had to be built — and then rebuilt, after it failed. A pile of boulders sits at the bottom of the wall to stave off damage from the waves.

"I see the challenge that the entire state and many states are facing: how to manage development along an inherently hazardous shoreline that is going to be increasingly hazardous under sea level rise and climate change," Mr. Lester said.

Sue Vaterlaus, the former Pacifica mayor, on the municipal pier.

All that armoring, as it's known, has saved the apartment complex. But it has come with a public cost: The beach has narrowed. In some parts, there is no beach left.

That is the problem facing many Bay Area communities: How much do you armor the coast, what do you choose to save, and who will have to move? Managed retreat, as it's called, has become a political lightning rod.

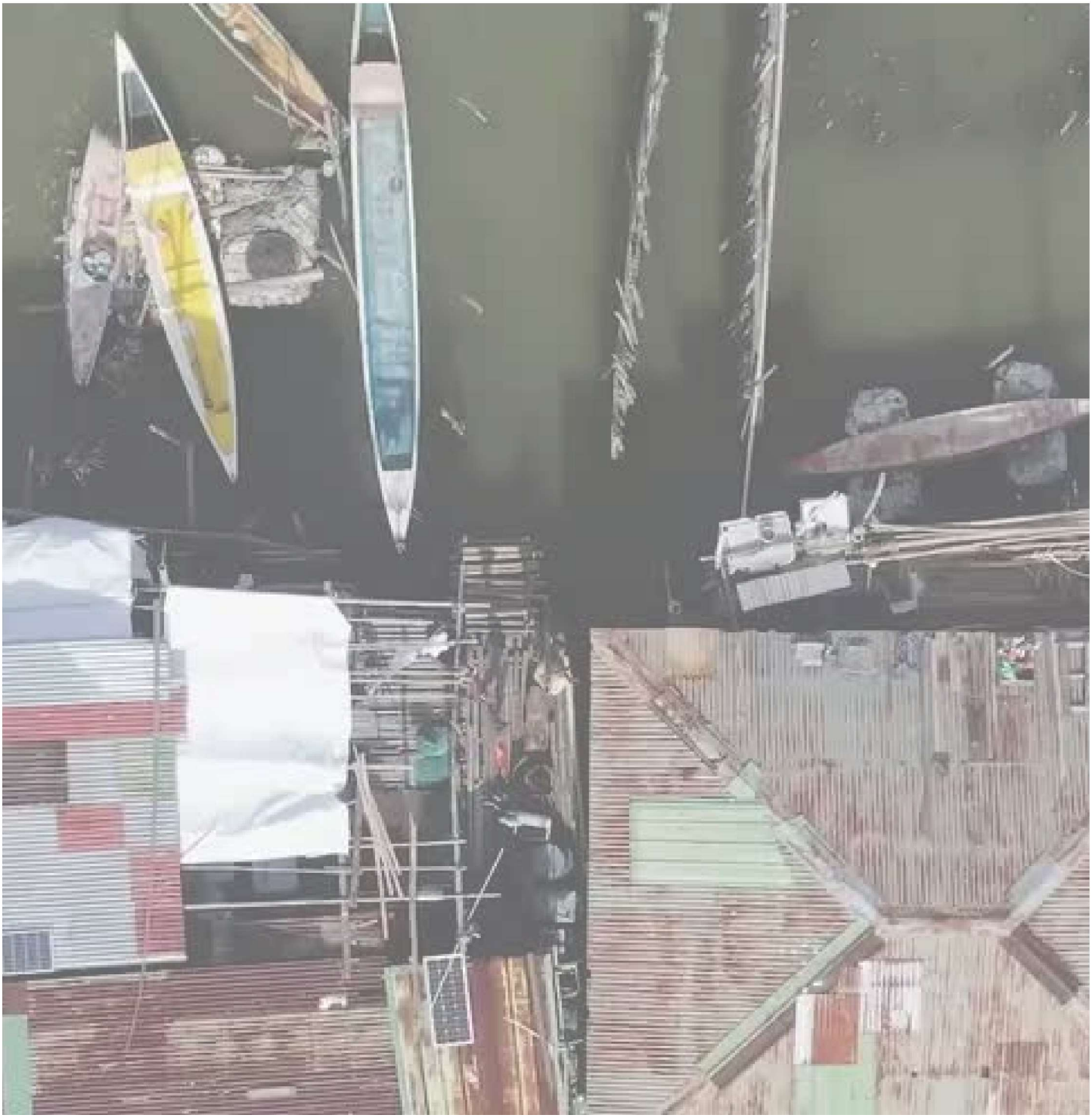
Money complicates matters in other ways: Property taxes are a key source of revenue. Forcing people to move away would punch holes in city budgets. And anyway, who would pay to buy out homeowners?

Pacifica, for instance, can't. Some single-family houses on the bluff are worth upward of $1 million.

Already, there's been unmanaged retreat in Pacifica. Some sea walls crumbled, at one point endangering a row of apartments. The 52 tenants were entitled to zero compensation. They just had to move — in one of the most expensive counties in the state. The city spent $620,000 on demolition.

Other apartments, built years ago when the bluffs were wider, are now precariously close to the edge.

In an interview in December, Sue Vaterlaus, who was the Pacifica mayor at the time, said she was unsure about their future. "It's a hard thing," she said. "I'm not in favor of managed retreat, but at some point some of them may have to go."



Pariahan, the
Philippines

The water ‘just came and never left’

To visit the village of Pariahan, just north of the Manila city limits, is like visiting the last residents of the mythical city of Atlantis.

Pariahan, an island once connected to the mainland by a strip of land, at one point had about 100 houses. You could pick oysters from the sea and Java plums from the trees. Children went to school here. On Sundays, there was Mass at the local church, its door facing Manila Bay.

I hired a boatman to ferry me and a photographer to Pariahan from the mainland. First came a crowded little island, then a few solitary houses standing on berms, then many more abandoned houses with window frames staring out like vacant eyes. Then, finally, a cluster of houses, standing on stilts, and boats parked out front.

There were salt flats around Pariahan long ago, then fish ponds, which drew the water from under the ground. The land began to slowly sink, and by the time a powerful storm came along 10 years ago the island had become like a bowl. The water rose up and poured in. “It just came and never left,” Benedicta Espiritu, 53, a lifelong resident, recalled.

Pariahan was submerged.

Ms. Espiritu, one of the few who remain here, raised the floor of the old house three times, and then built a new house on bamboo stilts.

The school roof has blown off. So Pariahan children now must pay for a 30-minute boat ride to attend class, which means they miss more often than not. Once a month, worshipers wade into church; a priest is ferried in from a nearby village.

Ms. Espiritu doesn’t plan to leave. She’s grown accustomed to fleeing the storms and cleaning up afterward. She fears moving anywhere else will be prohibitively expensive. Never mind that Pariahan is drowning.

“We don’t want to leave,” she said. “When you have coffee, sugar and rice, life is good. The air is free. There’s a solar panel for electricity.”

“We can live here.”

But Ms. Espiritu’s family has been told that the holdouts of Pariahan will have to leave soon. There’s a proposal to build a private airport nearby, on the edge of the slowly rising Manila Bay.

Panghulo Barangay, in Metro Manila.

Jason Gutierrez contributed reporting from Manila.

Ms. Sengupta has received a George Polk Award for her work in Congo, Liberia and other conflict zones. Mr. Lee has been a member of two teams that received Pulitzer Prizes; one for coverage of the Sept. 11 terrorist attack on New York City and the other for photographs chronicling the conflict in Afghanistan and Pakistan.

Correction: Feb. 13, 2020
An earlier version of this article gave an incorrect title for Laura Tam. She is a policy director at SPUR, not the executive director.

Correction: Feb. 13, 2020

An earlier version also implied incorrectly that Sue Vaterlaus is still the Pacifica mayor. While she was the mayor when interviewed in December, her term ended shortly after.